Historic, archived document

Do not assume content reflects current scientific knowledge, policies, or practices.

Ag 84L
no 370 1962
c.1
LIBRARY
JUL 9 1962

The seed-corn maggot on Beans

HOW TO CONTROL IT

LEAFLET NO. 370

U.S. DEPARTMENT OF AGRICULTURE

The seed-corn maggot on Beans

TC 7351

Sprouting limo bean seed damaged by the seed-corn maggot. Note maggots on the cotyledons.

HOW TO CONTROL IT

By JOHN C. ELMORE, formerly entomologist, Entomology Research Division, Agricultural Research Service

The beans you plant may not get past the sprouting stage if the seed-corn maggot [1] is in your fields.

The maggot occurs throughout the United States and in all other parts of the world that have a temperate climate. It feeds on almost any kind of tender plant material or decaying organic matter that may be in the soil.

It is a serious pest of beans, corn, peas, and melons. It attacks the sprouting seeds of these crops and the underground parts of the young plants. It also feeds in potato seed pieces, onions, turnips, and radishes.

The maggot is attracted to sprouting seeds—the preferred food—and to moist soil that is rich in organic matter.

Bean growers can control the seed-corn maggot by following certain cultural practices and by treating bean seeds with an insecticide before planting them.

LIFE STAGES

The life stages of the seed-corn maggot are egg, larva (maggot), pupa, and adult.

The adult seed-corn maggot resembles the house fly, but is smaller and more slender; it is about 1/5 inch long. It is the same as the house fly in color.

The female lays its eggs in moist soil that contains decaying plant matter or other larval food. The eggs hatch in 1 to 8 days. The higher the temperature, the shorter the hatching period.

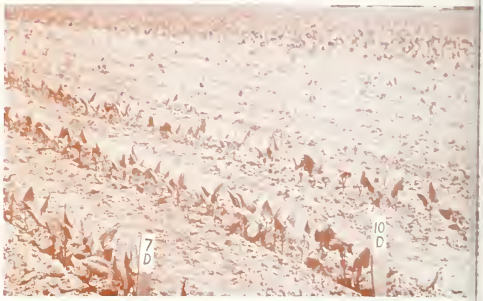
The newly hatched maggots begin feeding on decaying plant or animal matter near the soil surface. If sprouting seeds are near, the maggots are attracted to them.

When a maggot reaches full growth, in 10 to 16 days, it is about 1/4 inch long. It transforms to a reddish-brown pupa, which develops into a fly. The fly emerges from the pupal case in 10 to 20 days.

The life cycle—from egg to adult—is completed in 3 to 5 weeks during the bean-growing season. There are usually 4 or 5 generations a year in southern parts of the country, and 2 or 3 in northern parts.

DAMAGE TO BEANS

Maggots that hatch from eggs laid near planting time are in the soil when the seeds sprout. Many of these



TC 7214

Limo bean field showing loss of plant stand due to seed-corn maggot damage. Seeds planted in first three rows were treated with insecticide. Those in the adjoining rows were not treated.

[1] *Hylemya cilicrura.*

reach the seeds as soon as sprouting begins. They feed between the cotyledons, or halves, of the seeds.

In feeding on a seed, the maggots usually damage the germ—the embryo of the plant. Seeds with damaged germs either die or develop into plants that have malformed buds or baldheads. Such plants do not give normal yields.

Maggots that hatch after seeds sprout may bore into the stems beneath the soil surface and damage or kill the plants.

Seed-corn maggot damage occurs chiefly in early spring, and in wet, cool soil. If the soil is wet and cold and when the seeds sprout, damage is especially severe.

In heavily infested fields seed-corn maggots often cause such a poor stand of plants that the growers plow up the fields and replant.

CONTROL

Cultural Practices

Certain of the egg-laying and feeding habits of the seed-corn maggot suggest cultural practices that aid in control.

The flies lay most of their eggs in soil that contains large quantities of decaying plant or animal matter. Avoid the planting of beans in such soil. After applying organic fertilizer, or after turning under a cover crop, wait at least 3 weeks before preparing the soil for planting beans.

The flies lay eggs in moist soil. In preparing soil for planting beans, leave about an inch of dry, well-pulverized soil on the surface. Such soil is unattractive to the egg-laying flies.

The seed-corn maggot on Beans

HOW TO CONTROL IT

TC 7351

Sprouting lima bean seed damaged by the seed-corn maggot. Nate maggats an the cotyledans.

By JOHN C. ELMORE, farmerly entomalogist, Entomalagy Research Division, Agricultural Research Service

The beans you plant may not get past the sprouting stage if the seed-corn maggot [1] is in your fields.

The maggot occurs throughout the United States and in all other parts of the world that have a temperate climate. It feeds on almost any kind of tender plant material or decaying organic matter that may be in the soil.

It is a serious pest of beans, corn, peas, and melons. It attacks the sprouting seeds of these crops and the underground parts of the young plants. It also feeds in potato seed pieces, onions, turnips, and radishes.

The maggot is attracted to sprouting seeds—the preferred food—and to moist soil that is rich in organic matter.

Bean growers can control the seed-corn maggot by following certain cultural practices and by treating bean seeds with an insecticide before planting them.

LIFE STAGES

The life stages of the seed-corn maggot are egg, larva (maggot), pupa, and adult.

The adult seed-corn maggot resembles the house fly, but is smaller and more slender; it is about ⅕ inch long. It is the same as the house fly in color.

The female lays its eggs in moist soil that contains decaying plant matter or other larval food. The eggs hatch in 1 to 8 days. The higher the temperature, the shorter the hatching period.

The newly hatched maggots begin feeding on decaying plant or animal matter near the soil surface. If sprouting seeds are near, the maggots are attracted to them.

When a maggot reaches full growth, in 10 to 16 days, it is about ¼ inch long. It transforms to a reddish-brown pupa, which develops into a fly. The fly emerges from the pupal case in 10 to 20 days.

The life cycle—from egg to adult—is completed in 3 to 5 weeks during the bean-growing season. There are usually 4 or 5 generations a year in southern parts of the country, and 2 or 3 in northern parts.

DAMAGE TO BEANS

Maggots that hatch from eggs laid near planting time are in the soil when the seeds sprout. Many of these reach the seeds as soon as sprouting begins. They feed between the cotyledons, or halves, of the seeds.

TC 7214

Lima beon field shawing lass of plant stond due ta seed-corn moggat damage. Seeds planted in first three raws were treated with insecticide. Thase in the adjaining raws were not treated.

In feeding on a seed, the maggots usually damage the germ—the embryo of the plant. Seeds with damaged germs either die or develop into plants that have malformed buds or baldheads. Such plants do not give normal yields.

Maggots that hatch after seeds sprout may bore into the stems beneath the soil surface and damage or kill the plants.

Seed-corn maggot damage occurs chiefly in early spring, and in wet, cool soil. If the soil is wet and cold and when the seeds sprout, damage is especially severe.

In heavily infested fields seed-corn maggots often cause such a poor stand of plants that the growers plow up the fields and replant.

CONTROL

Cultural Practices

Certain of the egg-laying and feeding habits of the seed-corn maggot suggest cultural practices that aid in control.

The flies lay most of their eggs in soil that contains large quantities of decaying plant or animal matter. Avoid the planting of beans in such soil. After applying organic fertilizer, or after turning under a cover crop, wait at least 3 weeks before preparing the soil for planting beans.

The flies lay eggs in moist soil. In preparing soil for planting beans, leave about an inch of dry, well-pulverized soil on the surface. Such soil is unattractive to the egg-laying flies.

[1] *Hylemya cilicrara.*

Plant beans in warm, sunny weather. Such weather is unfavorable for the flies' egg laying, and planting in such weather hastens germination of the beans. Quick germination lessens the likelihood of maggot injury because it shortens the period during which the seeds and young plants are most susceptible to injury.

Slurry Treatment

Before planting bean seeds, protect them from maggot injury by coating them with a thin slurry, or paste, that contains an insecticide and a fungicide.

The beans retain the coating after they are planted, and maggots that attack them are killed by contact with the insecticide. The fungicide is necessary to protect the beans from disease.

Aldrin, dieldrin, or lindane is a suitable insecticide. Use a finely ground, solvent-free wettable powder of 75-percent strength. Do not use a lower strength. Wit a lower strength you might be unable to get enough fungicide and insecticide on the seeds to be effective.

The recommended fungicides are thiram and captan. The manufacturers of these fungicides offer 75-percent wettable powders that are especially prepared for use in slurry.

If you follow the recommendations given here, less than an ounce of chemical per acre will reach the soil. This amount of insecticide in the soil does not give off-flavor to bean crops or bean products.

PREPARING THE SLURRY.—The stock supply of slurry is prepared by mixing the insecticide and the fungicide with water.

To prepare slurry in an amount sufficient to treat 50 pounds of seed, mix ⅓ ounce (4 level teaspoonfuls) of the insecticide, 1½ ounces (9 level tablespoonfuls) of the fungicide, and 8 fluid ounces (1 cupful) of water. Stir the mixture thoroughly. Let it stand about 10 minutes before using.

TREATING THE SEED.—Slurry treatment consists in agitating the seed and slurry within a container.

In treating a small quantity of seed, use any smooth container that can be closed tightly and rolled and tumbled. A fruit jar or friction-top can is satisfactory for this purpose.

The container should be only half filled with seed in each operation. Several operations, with a new batch of seed each time, may be necessary.

Use 1 teaspoonful of slurry per pound of seed. (In treating the seed of large lima beans, reduce the amount of slurry by half.) In treating the first batch of seed, increase the amount of slurry about 10 percent to compensate for the slurry that will stick to the inside of the container.

Sprinkle the slurry over the seed, close the container, then roll and tumble the container until the seed is smoothly coated. Do not leave the treated seed in the container. Put it in a cloth sack to dry.

If you plan to treat as much as 1,000 pounds of bean seed each season, consider buying a slurry-treating machine. It regulates the flow of seed and slurry, causing the seed to receive a uniform coating. By mixing 6 ounces of the insecticide, 1½ pounds of the fungicide, and 1 gallon of water, you get an amount of slurry that will coat about 900 pounds of bean seed when used in the machine. The manufacturer of the machine furnishes directions for using it.

A clean cement mixer may be used as a substitute for a slurry-treating machine. Prepare a slurry by mixing the ingredients in the proportions indicated in the reference to slurry-treating machines. Measure out 1 pint of slurry for each 100 pounds of seed. Do not let the mixer turn longer than is necessary to coat the seed. Too long or too rapid mixing may damage the seed.

HANDLING TREATED SEED.—Moist seed will not feed properly through the planter. Dry the seed at least 1 hour before planting.

It is not necessary to plant the seed the same day you treat it. Set it aside for several days if you wish. (Treated lima bean seed may be kept as long as 30 days before planting.) After it has dried, put it in bags made of heavy paper or closely woven cloth; such bags keep the powder from sifting out.

CUSTOM TREATING.—In some States, seedsmen or others who wish to do custom treating of seed are required to obtain a license. Ask local agricultural authorities about licensing before doing any custom treating.

If treated seed is offered for sale, each bag must carry a label giving the name of the insecticide used and stating that the seed is unfit for food or feed purposes.

PRECAUTIONS

Most insecticides and fungicides are poisonous. Store them where children, pets, and livestock cannot reach them. Handle them with care. Follow all directions and heed all precautions on the container labels. . . . Aldrin, dieldrin, and lindane can be absorbed through the skin. When you work with one of these insecticides, avoid spilling it on the skin and keep it out of the eyes, nose, and mouth. However, if any is spilled on the skin, bathe immediately and remove contaminated clothing.

For sale by the Supt. of Documents, U.S. Government Printing Office
Washington 25, D.C. - Price 5 cents
Issued September 1954
Slightly revised June 1962

☆ U.S. GOVERNMENT PRINTING OFFICE : 1962—O-635158